DOCUMENT RESUME

EA 001 892

ED 025 043

By- Caldwell, Michael S.

Input Evaluation and Educational Planning.

Ohio State Univ., Columbus. Evaluation Center.
Pub Date 15 Jan 68
Note- 23p.
EDRS Price MF-$0.25 HC-$1.25
Descriptors- Decision Making, Educational Improvement, *Educational Planning, Educational Strategies, *Evaluation Criteria, Input Output, *Program Development, *Program Evaluation
Identifiers- *CIPP Model, ESEA Title 1

Educational programs, regarded as inputs, may be developed within a procedural framework to achieve outputs of desired change and improvement. Eight criteria for assessing plans and strategies are relevance, legality, congruence, legitimacy, compatibility, balance, practicability, and cost/effectiveness. (JK)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

INPUT EVALUATION AND EDUCATIONAL PLANNING

Michael S. Caldwell
Associate Director
The Ohio State University
Evaluation Center

ED025043

January 15, 1968

EVALUATION CENTER
THE OHIO STATE UNIVERSITY
College of Education

EA 001 832

The EVALUATION CENTER, an agency of the College of Education, is committed to advancing the science and practice of educational evaluation. More specifically, the purpose of the Center is to increase education's capability to obtain and use information for planning, programming, implementing and evolving educational activities. To serve this purpose, the Center's interdisciplinary team engages in research, development, instruction, leadership and service activities.

HISTORY

The origin of the present Center traces back to the establishment of the Ohio State University Test Development Center in 1962. Due to the urgent need for a more comprehensive approach to evaluation than that afforded by standardized testing, the Test Development Center was expanded in 1965 into the present Evaluation Center which is concerned with many modes of evaluation in addition to standardized testing. However, test development remains an important part of the Evaluation Center program.

GOALS

The broad objectives of the currently constituted Center are:

to increase scientific knowledge of educational evaluation and planning;
to develop evaluation strategies and designs;
to develop evaluation methods and materials;
to provide instruction in evaluation;
to disseminate information related to educational evaluation;
to assist educationists in evaluating their programs.

THE OHIO STATE UNIVERSITY

EVALUATION CENTER

1712 NEIL AVENUE
COLUMBUS, OHIO 43210

ORGANIZATION

To serve its complex objectives, the Center has developed an interdisciplinary team. Currently, the staff of the Center consists of fifty-four members, including five professorial positions, plus a varying number of visiting faculty. The staff and visiting professors bring expertise from the fields of economics, education (administration, curriculum and supervision, elementary and secondary school teaching, evaluation, mathematics, planning, research methodology, and tests and measurement), psychology, sociology, systems analysis, and urban planning. The Center is organized into four divisions: Administration and Program Development; Leadership in Evaluation; Research in Evaluation; and Test Development. The Center is administered by a director and an associate director for each division.

STAFF

Daniel L. Stufflebeam, Director
Michael S. Caldwell, Associate Director
Administration and Program Development
Edwin G. Novak, Associate Director
Research in Evaluation
Jack M. Ott, Associate Director
Test Development
Blaine R. Worthen, Associate Director
Leadership in Evaluation

ED025043

INTRODUCTION

This paper represents a first approximation attempt at devising a "way of looking" at educational planning and the assessment of this planning. An adequate coverage of the points mentioned here would require a document the scope and depth of which this writer is not capable of producing at present. However, the purposes of this paper are heuristic in nature and are not so ambitious as to suggest that I have answers to the problems of educational planning and plans assessment.

These remarks are not intended as an apology or disclaimer but are to request reactions to what this paper says—or does not say.

Michael S. Caldwell

Input Evaluation and Educational Planning

American education at all levels has become enamored with the concept of change. Both the literature and the dialogue of the field are liberally spiced with such terms as change, innovation, planned change, and planning for change. A cursory examination of the literature and an analysis of the concept of change as revealed by this literature highlights one crucial factor—the key aspect of the concept is not change but planning. While most educators are quite willing to accept the inevitability of change, they are not willing to accept "change for the sake of change." Thus, the focus, and in this writer's opinion, a proper one, is upon giving proper direction and substance to change through sound educational planning.

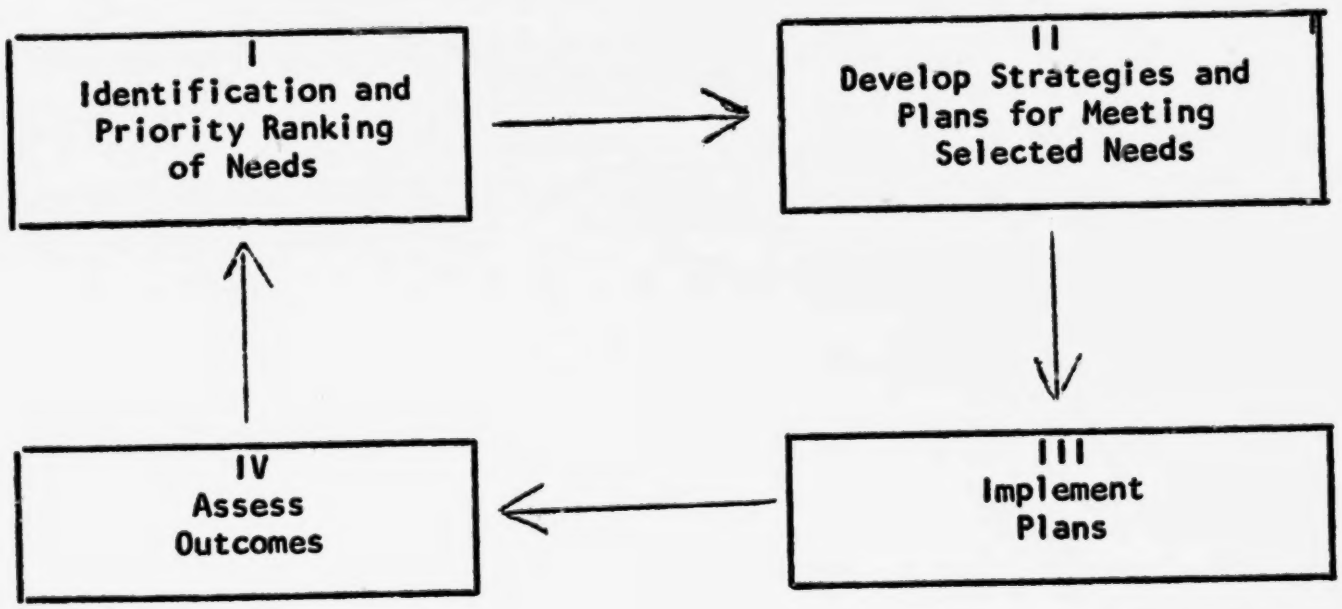
The Ohio State University Evaluation Center is concerned with efforts to improve American education and assumes that effective planning is crucial in any attempt to effect such improvement. The CIPP Evaluation Strategy[1] which is the basis for much of the Center's activities is composed of four stages—one of which relates directly to educational planning. Input Evaluation refers to the assessment of the inputs which one is able or willing to invest in order to realize certain outputs, i.e., the desired change or improvement. In an educational setting inputs are normally programs or projects both of which are, or should be, based on sound planning. Thus, Input Evaluation may be thought of as a kind of <u>plans assessment</u>.

---

[1]Daniel L. Stufflebeam. "The Use and Abuse of Evaluation in Title III," Theory Into Practice, VI (June, 1967), pp. 129-131.

The purpose of this paper is two-fold—(1) to provide a framework within which the concept of Input Evaluation might be viewed and (2) to suggest an approach for actually implementing an Input Evaluation. In the broadest sense there are only four major steps in instituting any kind of change or improvement in an educational setting, i.e., determine what should be done, determine how to do it, do it, and determine the impact of what was done. These steps suggest a system such as the one depicted in Figure I below.

Figure I Educational Improvement Cycle



Obviously, the schema depicted in Figure I is greatly over simplified and is, in fact, so broad that it is meaningless in an operational sense. Furthermore it completely disregards a large body of information relative to the concept of change. However, the schema does fulfill one important function. It provides a quick overview of the total process and provides handles which allow one to locate himself in the total process.

The terms strategy and plan are used throughout the discussion which follows and require some explanation. A strategy is a general approach to a situation and a plan is a highly explicit—possibly even programmed—set of activities through which the strategy is operationalized. If a superintendent of schools wishes to institute some change in response to a crucial need—say, low achievement of disadvantaged children in reading—he may employ one (or more) of several strategies, e.g., upgrade his present teaching staff, devote a larger portion of the school day to reading, hold weekend or evening reading enrichment classes, employ a remedial reading teacher, etc. Suppose the superintendent chooses to upgrade his present teaching staff as a general strategy. He then must develop several alternative preliminary plans, e.g., operate an internal in-service education program, request a nearby college to provide an in-service program, have his teachers enroll in formal college courses, etc. If he chooses (from among the alternative preliminary plans) to operate an internal in-service program, he then must develop a very explicit action plan which will detail exactly how such a program is to be operated.

A College Dean who is attempting to promote research and development activities is faced with a similar situation. He must select from several general strategies, e.g., employ new research and development oriented staff members, create a bureau of research, charge some college officer to promote research and development activities and give technical support to staff members, etc.[1] Regardless of which of these general strategies he chooses, and he may choose some combination of strategies, he must develop specific procedures, i.e., action plans, through which the goals of the strategy can be realized.

State departments of education are also faced with planning situations which call for the selection of general strategies and specific action plans. For example, a state department of education might perceive a need to improve urban education programs for disadvantaged children. Several strategies are available on the state level, e.g., adjustment of certification requirements for teachers of the disadvantaged, adjustment of state aid formulas to provide additional state funds to urban areas, increase the percentage of total state Elementary and Secondary Act Title I funds for urban areas, etc. After deciding upon a general strategy, detailed plans would have to be developed to implement the strategy.

Once an educational system or agency has focused on a need which requires attention, what steps must be taken to insure sound planning

---

[1]For a more detailed discussion of some of the strategies which are employed to promote research and development activities in university settings see Seiber, Sam D., The Organization of Educational Research, Bureau of Applied Social Research, Columbia University, 1966.

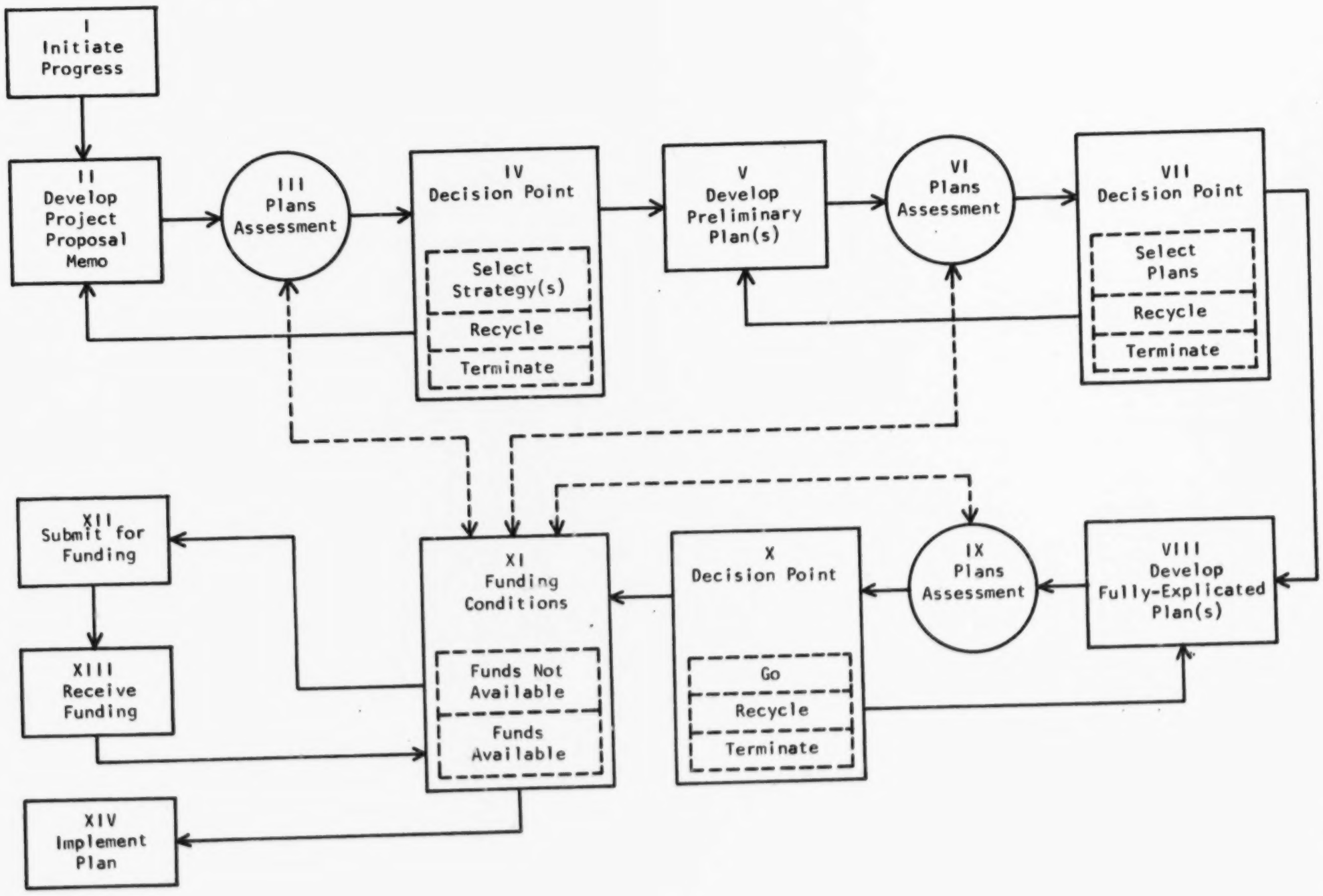
for attacking that need? Figure II is a schema of a process which might be used in the second stage of the Educational Improvement Cycle, i.e., developing strategies and plans for meeting selected needs. This schema is intended only as a guide and will require a great deal of explication in the context of the specific agency or system before it can be implemented, e.g. What person or unit is responsible for the various steps?; Who makes decisions at various stages?; What is the schedule?

The program selection process begins (step I) when a need is identified and a decision is made to explore the possibilities of meeting that need. For example, suppose the board of education of a metropolitan school system decides to attack the problem of de facto segregation. The board would then charge the superintendent of schools to develop a program proposal memo (step II). A program proposal memo is a brief document which might contain (a) a description of the need and a rationale for attacking the need, (b) the broad goals to be achieved and (c) alternative strategies (with strengths and weaknesses of each) for achieving the broad goals.

After the superintendent has developed this memo proposing alternative strategies, e.g., revise existing attendance area boundaries, bus children across attendance area lines, or institute open enrollment in the district, the memo and the strategies are reviewed (step III). Since the various review steps (III, VI and IX) are treated in some detail later, no explanation of these steps will be offered at this point. At step IV the primary decision-maker, in this case the board of

Figure II

Program Selection Process



education, has three alternatives, (1) choose from the alternative strategies, (2) in the event that none of the alternatives is satisfactory, ask the superintendent to suggest additional strategies, or (3) terminate the process.

If the board of education selects a general solution strategy—say, busing children across attendance area boundaries—preliminary plans for achieving the goals of the strategy must be developed (step V). The preliminary plans document is much more explicit than the program proposal memo and should contain (a) a description of the need and a rationale for attacking the need, (b) the broad goals to be achieved, (c) a description of and justification for the selected strategy, and (d) alternative preliminary plans to implement the strategy. These preliminary plans should include, at least in first approximation form, information relative to (1) the person or unit responsible for implementing the plan, (2) the resources which will be necessary, (3) a schedule of activities, (4) cost estimates and (5) estimated outcomes.

The review of the preliminary action plans document (step VI) is much like the review in step III except that as plans become more explicit review techniques become more refined and rigorous. At step VII the decision-maker has three alternatives, i.e., choose from the alternatives, recycle and ask for additional alternatives, or decide to terminate the process.

After a decision is reached regarding which preliminary plan or combination of preliminary plans will be used, e.g., which children will be involved, how children will be selected, which school buildings will be involved, etc., a fully explicated action plan must be developed (step VIII). An action plan which is ready for implementation should contain (a) a description of the need which the action plan is designed to meet, (b) the goals (expected outcomes) of the plan, (c) the relationship of the expected outcomes of the plan to the need, i.e., to what degree will the need be met if the goals of the action plan are achieved, (d) the functions and/or activities which the plan requires, (e) the resource and concomitant cost requirements of the functions and activities, and (f) the scheduling of activities. Perhaps the best definition of an action plan which is ready for implementation is a plan which is detailed and programmed to such an extent that some individual who has not been involved in the planning will be able to implement the plan and will most likely be able to achieve the goals of the plan.

These alternative action plans will have a final review (step IX) the purpose of which will be to search for programming inconsistencies and to assess and compare the plans in terms of cost/effectiveness considerations. At step X there will be only two decision alternatives in most cases—select from alternative action plans or recycle for minor revisions and plan refinement. While a decision to terminate is always possible, it is not likely at this point unless some changes and/or pressures which are external to the process are brought to bear.

Steps XI, XII, XIII and XIV are self-explanatory. However, funding considerations are crucial and must be regarded as possible constraints throughout the process. In other words, unless some "feel" for the general funding situation is fed into the process (note the dotted lines in the schema) from the very beginning, the whole activity may be just an academic exercise—and a costly one at that.

Figure II, The Program Selection Process, portrays the manner in which an agency might develop and assess strategies and plans for attacking an identified need. Steps IV, VII and X are key decision-making points in the process and sound decision-making at these points must be based on valid and reliable information. Such information must be gathered, analyzed and reported at the review points (steps III, VI and IX) which immediately precede the steps at which decisions are made.

The purpose of the review steps is to provide information for decision-making relative to approaches to meeting needs. Obviously, this is just another way of saying that Input Evaluation provides information for answering the questions which decision-makers might (or should) ask. How does one generate crucial questions about strategies and plans for meeting needs? If one posed all of the possible questions relative to the viability of a strategy or action plan for meeting a given need, these questions could all be grouped under one or the other (or possible a combination of the two) of two general criteria—desirability considerations and feasibility considerations.

While criteria classes are useful in the generation of key questions, desirability and feasibility are too broad to be of much value. However, by applying desirability and feasibility considerations to strategies in terms of what the strategy is for, where it will be implemented, by whom it will be implemented and in comparison with other alternative strategies, it might be possible to generate more specific and more useful criteria. The idea is to juxtapose the strategy or plan with the identified need, with the context, with the implementing agency and with alternative strategies or plans and to consider the general criteria of desirability and feasibility in terms of these factors. This will serve to highlight specific criteria which might be applied to the proposed strategies and plans. There are at least eight (and probably more) criteria which might be generated in this manner, (1) relevance, (2) legality, (3) congruence, (4) legitimacy, (5) compatibility, (6) balance, (7) practicability and (8) cost/effectiveness. These criteria are not totally discrete and there is some overlap in certain areas. They are, however, most useful in terms of one of their primary purposes, i.e., to assist in the generation of crucial questions which the decision-maker should consider.

Figure III is a suggested framework for conducting the plans assessments (stages III, VI and IX) in the Program Selection Process. The illustrative material contained in the cells of the framework refers only to strategies and, therefore, appears to refer only to the plans assessment (stage III) for evaluating strategies. However,

Figure III

An Approach to Plans Assessment

	RELEVANCE	LEGALITY	CONGRUENCE	LEGITIMACY	COMPATIBILITY	BALANCE	PRACTICABILITY	COST/EFFECTIVENESS
PURPOSE OF APPLYING THE CRITERION	to determine the relevance of the proposed solution strategy to the identified need areas	to determine the legal status of the proposed solution strategy relative to the context within which it is to be implemented	to determine the congruence of the solution strategy with the value system(s) of the context within which it is to be implemented	to determine if the solution strategy is within the purview of the agency charged with implementation	to determine the compatibility of the strategy with the value system(s), i.e., purposes and goals, of the implementing agency	to determine the impact of the strategy on other components (sub-systems) of the system and on the weights and interrelationships of these system elements	to determine the practicability of the solution strategy in terms of achieving its stated purposes (end-products)	to determine the relative desirability of the solution strategy (in comparison with alternative solution strategies) in terms of the ratio of necessary inputs (costs) to expected outputs (effectiveness)
ILLUSTRATIVE TYPES OF QUESTIONS	Are the purposes of the solution strategy directly related to the statement of need? How much of the need would be filled if the end-products of the strategy were to become inputs in the need situation? How reasonable are the assumptions which relate intermediate steps, e.g., teaching ability, to ultimate objectives, e.g., student achievement?	Are there laws in the context within which the strategy is to be used which would prohibit its implementation? If the legality of the strategy and/or its constituent activities is unclear, what are the chances that it might be judged to be illegal?	What value assumptions are embodied in the actions necessary to implement the proposed strategy? Which of these value assumptions are most likely to conflict with the value system(s) of the context? What is the flexibility level of the context in terms of each of the identified areas of possible value conflict?	Is this agency authorized to implement such a set of actions? From whom should clarification be sought regarding the limits of the agency's authority?	What are the stated purposes and/or program foci of the implementing agency? Do these purposes and/or program foci actually operate on the implementation level? Is the focus of the strategy in harmony with the purposes and program foci on both the policy level and the operational level?	What are the implications (both short and long-range) of implementing the strategy in terms of the purpose and/or program foci of the agency? Assuming that the agency's total program involves several components, e.g., research, service and instruction, which are in some kind of balance, what are the implications of the strategy for the balance of the total program?	Are the actions called for reasonable in terms of state of the art constraints? Is the solution strategy realistic in terms of resource availability constraints? Does the strategy adequately provide for logistical concerns? Are there internal (organizational) constraints which might function as barriers to success? Are there external (contextual) constraints which might act as impediments to the achievement of the solution strategy purposes?	What outputs can be expected at various resource use levels? What are the <u>real</u> benefits which will be realized from this strategy? What are the costs of the <u>real</u> benefits which will be realized?
POSSIBLE METHODOLOGICAL APPROACHES	Analysis of the logical consistency of statements of relationship between strategy end-products and the need. Analysis of case studies of similar strategies applied to similar needs in analogous or nearly analogous contexts. Simulation exercises in which the expected outcomes of the strategy are assumed to be in operation in the need area. Prediction studies to give insights into the degree to which the identified need is a function of the variables to be attacked by the strategy.	If legal questions cannot be answered with a high degree of certainty, legal counsel should be sought.	Analysis of the strategy in terms of either explicit or implicit value positions. Juxtapose these value positions with those of the context. Assess the "strength" of contextual value assumptions which are most likely to be in conflict with the strategy.	Examine the charter of the institution or unit which is to implement the strategy or plan. Question higher administrative authority. Analyze in detail contracts or agreements between the implementing agency and the representative of the context.	Analysis of the policy and operational levels of the implementary agency's purposes and program foci. Analysis of the focus of the strategy (will probably involve prediction and/or simulation studies on the operational level). Comparisons of agency and strategy analyses.	Analysis of system (agency) components and the resources necessary to operate these components. Analysis of the resource drain from other components in order to attack the component under consideration. Prediction and simulation studies of short-range and long-range agency alterations and resource allocations necessary for implementing the strategy.	Detailed analysis of the knowledge, hardware and procedural requirements of the strategy. Analysis of strategy resource requirements, resources on hand, availability of resources which must be procured and the availability of funds. Application of various networking and/or programming techniques. Analysis of organizational structure in terms of crucial strategy requirements, e.g., lines of responsibility and authority and channels of communication. Analysis and assessment of the possible impact of contextual constraints, e.g., civil rights agitation and political considerations.	Simulation of the impacts of increments or decrements to funding levels on expected outcomes. Application of marginal analysis techniques to determine expected <u>real</u> (output increments less trade-off decrements) benefits. Detailed budget analysis using programmed budget techniques. Comparisons of alternative strategies based on information gained from the above approaches.

by substituting the term preliminary plan for the term strategy, the framework has application at stage VI and by substituting the term action plan, it has application at stage IX.

While it is true that certain criteria seem to be more applicable at certain stages of the Program Selection Process than at others, extreme caution should be exercised in completely disregarding a criterion at any level. For example, if one applies relevance at stage III and does not consider practicability he may expend a great deal of effort developing a strategy which cannot be implemented. In other words, in order to avoid costly unproductive mental exercises all criteria should be checked at all review steps. If a criterion is considered and a decision is made that the criterion does not apply at that point, no harm is done but to overlook a criterion which does apply could prove disastrous.

The primary difference between the application of the criteria at various plans assessment stages is one of degree. Strategies (evaluated at stage III) are more global than are preliminary plans (evaluated at stage VI) which, in turn, are not as explicit as highly detailed action plans (evaluated at stage IX). As plans become more explicit and detailed, questions and approaches to answer these questions become much more sophisticated.

Relevance This criterion refers to the degree to which the need will be met if the purposes (end-products) of the strategy or action plan are achieved. The criterion of relevance serves to keep planners

"on-track" in developing strategies and plans. In order to avoid statements such as "I achieved all of the objectives of my plan but didn't meet the need," planners must apply this criterion as rigorously as possible at all stages of the Program Selection Process.

Legality This criterion grows out of the juxtaposition of the strategy or plan and the context in which it is to be implemented. On the face of it, this seems to be a simple criterion to apply; however, there are strategies and plans which may be legal in one context but not legal in another. For example, a strategy or plan which included a biology curriculum program built around certain concepts of human evolution might be illegal in states (there are presently two such states) which have laws regarding the teaching of evolution. Also, difficulties have been experienced in the implementation of certain Elementary and Secondary Education Act programs because of laws and the interpretation of these laws in some states regarding the separation of church and state.

Congruence The criterion of congruence relates to the degree to which a proposed strategy or plan is consistent with the value system(s) of the context in which it is to be implemented. For example, it has been proposed that one possible solution strategy for food shortages in India would be to slaughter sacred cows. It is contended that this strategy would have a positive impact on the need in at least two ways—(1) the animals themselves could be used for food and (2) the crops which these animals eat or destroy as they roam the countryside could be used for human consumption. While such

a strategy might be considered highly desirable in terms of its relevance to the need, it is clearly in opposition to certain values which are strongly held by significant proportions of the Indian population.

It is quite possible that strategies and plans which include highly innovative curriculum practices and/or teaching techniques might enjoy success in one school district and experience failure in another. One possible hypothesis for the occurrence of such a situation would be that such practices and techniques are consistent with the value system(s) of one context and are less consistent or even inconsistent with the values of the other. The point of these illustrations is simple, a strategy or plan must be considered in terms of its "fit" with the context in which it is to be implemented.

Legitimacy This criterion grows out of juxtaposing the strategy with the unit (individual or agency) charged with implementing that strategy and refers to whether the strategy is within the purview of the implementing unit.* The application of this criterion points up some interesting and highly crucial types of questions regarding levels and types of responsibility and authority , i.e., do I

---

*In some situations certain of the criteria in Figure III should be applied by two different agencies in two different frames of reference, e.g., by the agency, such as a public school system, within which the plan will be implemented and by the agency, such as a college or university unit, which will implement the plan.

(individual or agency) have the necessary authorization to implement this plan? For example, in the previously mentioned de facto segregation situation, while the alteration of attendance area boundaries might be considered as appropriately within the realm of the board of education's authority, it would certainly not be within the purview of a building principal's authority.

The application of the criterion of legitimacy becomes much more complex when more than one agency is involved in implementing the plan. There are numerous examples which one can cite in which a public school system and some unit of a college of education collaborate on a plan which is implemented within the public school system by both agencies.

Compatibility The criterion refers to the compatibility of the proposed strategy in terms of the purposes of the implementing agency. While the criterion of legitimacy relates to the question, "Can I do this?", compatibility is directed toward the question, "Should I do it?". For example, public school systems often ask for assistance from some unit in a university (most usually a college or school of education). The university unit must determine if providing such services would be appropriate in terms of its own goals, purposes and program foci.

Balance The criterion of balance assumes that the settings in which solution strategies will be applied are multi-objective and are composed of numerous program elements (sub-systems). For example,

the total program of an educational agency is composed of discrete but interrelated substantive and skill elements such as reading, math and social studies. One possible solution strategy for a problem in social studies might be to invest all available resources into upgrading the program in this area. Obviously such a strategy would, while it might solve the social studies problem, seriously imbalance the total school program.

The above illustration is highly unlikely to occur when considered only in terms of a specific decision at a specific point in time. It is however a realistic example if decisions made today have implications for decisions made at some future point. While the classic illustration of this point involves future cost implications of decisions made in the 1950's to develop certain types of military aircraft, the Elementary and Secondary Education Act of 1965 provides a concrete illustration in the field of Education. The guidelines for Title III projects include a commitment requirement from local educational agencies involving "phasing out Federal support over a three-year period through gradual cost absorption by local or other funding."[1] Thus, local educational decision-makers, when they accept federal funding for Title III programs, are commiting future local resources to continue programs which are initiated at the present time. It is conceivable that such commitments, if met, could result in local resource allocation concentrations

---

[1] Title III guidelines p.9.

which might create serious system balance problems in three to five years. It is therefore imperative that educational planners when applying the criterion of balance not only consider immediate implications but also engage in predictive studies which would give indications of future implications of present decisions.

Practicability The criterion of practicability refers to how realistic the proposed solution strategy is in terms of achieving its stated purposes. In other words, what conditions must exist, to what degree must they exist and what are the chances that they will exist in order for this solution strategy to be successful? In order to apply this criterion and to assess the strategies and plans in terms of it, the education planner must be aware of six major types of constraints which might operate as barriers to success—(1) state of the art constraints, (2) resource availability constraints, (3) logistical constraints, (4) internal (organizational) constraints and (5) external (contextual) constraints. While it is true that these classes of constraints are not discrete and do overlap, it is useful to highlight them because of their cruciality to the educational planner as he applies the practicability criterion.

1. State of the Art Constraints It is conceivable that a solution strategy might require some piece of hardware, e.g., an individual computer, and accompanying software, e.g., a learning program. Some other solution strategy might require a standardized social studies instrument to be administered to children learning to

read by the I.T.A. Method. Do such items of hardware and/or software exist? Have techniques necessary to implement some crucial phase of the strategy been developed? These questions are indicative of information which the educational planner needs in order to make sound judgments regarding potential state of the art constraints.

2. Resource Availability Constraints The educational planner must have information regarding the resources, e.g., men and material, necessary to implement the proposed solution strategy and must assess the availability of such resources. If such resources are not on hand, can they be procured and, if so, are funds available to do so?

3. Logistical Constraints Broadly defined, logistical constraints are those associated with the transportation and scheduling of resources, i.e., having the right resources, in the right amounts, at the right place and at the right time. In order for the planner to assess the programming of a solution strategy, he must have information which gives him a picture of the total activity. Various networking techniques are valuable tools for providing such information.[1]

---

[1]For a comprehensive examination of the uses of such techniques see H. S. Woodgate, Planning by Network, 1964.

4. Internal (organizational) Constraints A particular solution strategy may require close coordination and cooperation among several units and/or individuals within the implementing agency. For example, an after-school study center might involve such cooperation and coordination among school building maintenance personnel, bus drivers, teachers, etc. If no communication bridges have been built or, if for some reason the organizational structure of the school inhibits such communication, a number of problems might arise.
5. External (contextual) Constraints In all contexts there are forces and/or specific organizations which might place constraints on a given solution strategy, e.g., political forces, civil rights groups, religious groups, parents, etc. For example a solution strategy which involves evening study centers for young children might raise serious security questions from parent groups and from police authorities.

Cost/Effectiveness This criterion grows out of juxtaposing the proposed strategy with alternative strategies. Translated freely the application of this criterion should provide decision-makers with the indications of which of several alternative strategies will give "more bang for the buck." Decision-makers need to compare alternative strategies in terms of what benefits (outputs) are expected and what these benefits will cost (inputs).

In determining the benefits to be derived from a given strategy, a distinction should be made between gross benefits and real benefits. Real benefits are determined by the following formula—gross increments less trade-off decrements = real benefits. Gross increments refers to the total benefits to be realized from the implementation of the plan. Decrements are those things which must be surrendered in order to implement the plan. For example, a plan which requires more teacher time and student time to be devoted to reading may realize reading gains at the expense of gains in some other curriculum area. A second type of decrement is much more nebulous but is real just the same. Any decision to implement a strategy which requires resources (and all do) is also a decision not to devote those same resources in some other part of the system. If it were possible to determine all possible combinations of resource usage in all possible combinations of system elements, it might be possible to quantify this second type of decrement. Obviously, this situation will never occur and the decision-maker must live with the fact that any decision to commit resources is made without <u>full</u> knowledge of what is being given up.